

4.0 ENVIRONMENTAL CONSEQUENCES

The Environmental Consequences describes the changes or impacts to natural, human, and cultural environmental resources that can be expected from implementing the Proposed Action or the No-Action Alternative. The Environmental Consequences section forms the scientific and analytic basis for the EA (40 CFR 1502.14). To reduce excessive paperwork, it is analytic rather than encyclopedic (40 CFR 1502.2(a) and 1500.4 (b)).

Environmental impacts can be positive (beneficial) or negative (adverse) as a result of the action (direct) or as a secondary (indirect) result, and can be permanent or long-lasting (long-term), or temporary or of short duration (short-term). Impacts can vary in degree or magnitude from no change, or only slightly detectable change, to a total change in the environmental condition or system once the project has been implemented. The assessment includes identifying initial impacts (including the type of impacts, location, and magnitude), and mitigation, where necessary, to reduce impacts to less than significant levels. A Mitigation Action Plan prepared for the project summarizes Western's mitigation commitments and action plans (Appendix A).

4.1 LAND USE

The assessment of potential impacts on land jurisdiction and land use focused on existing, planned, and future land uses along the proposed project alignment. Impacts were assessed based on whether the project would result in substantial changes to land uses along the proposed project alignment, be incompatible with uses on adjacent properties, or be in conflict with applicable land use plans. Land use impacts would be considered significant if project implementation would result in:

- Physical division of an established residential or mixed-use community.
- Conflict with applicable land use plans, policies, goals, or regulations of an agency with jurisdiction over the project (including recreational or wilderness land management).
- Conversion of prime or unique farmlands to non-agricultural uses.
- Project-related changes that alter or otherwise physically affect established, designated, or planned recreation or wilderness areas or activities.
- Project-related changes that increase or decrease accessibility to areas established, designated, or planned for recreation or wilderness.

- Project-related changes that affect duration, quantity, and quality of impact to recreational or wilderness resources.
- Project-related changes that affect the power distribution of existing electrical transmission distribution.

No changes to land jurisdiction would occur as a result of this action. Western would administer the utility ROW and would continue to cross lands managed by the BOR, NPS and Boulder City.

No impacts to existing or planned residential, commercial, or industrial uses would be expected to occur. Except where the proposed project alignment splits as it enters the Mead Substation, the proposed alignment would use existing transmission line ROWs and corridors. None of the structure replacement activities are expected to impact any other transmission lines in the project area, including those operated by Nevada Power Company, Colorado River Commission, or Southern Nevada Water Authority. Direct impacts to land use from road construction along the route would be minor since minimal new road construction would occur and relatively few miles of access roads would require upgrading. The proposed project would not affect land use plans or policies because the project is within an existing utility ROW, so no land use management plans or policies need to change to accommodate the reconfigured transmission line.

No impacts to recreation would occur as a result of the Proposed Action. Although the proposed project facilities cross the LMNRA, they would occur within existing utility corridors. Dispersed recreation use in the area would be unaffected in the long-term. Construction activities may result in short-term impacts to recreationalists from noise or access disturbance, but these impacts would likely be minimal. Following construction activities, NPS lands affected by the project would remain available for dispersed recreation activities.

Project implementation would not result in meeting or exceeding significance thresholds. As a result, impacts to land jurisdiction, land use, and recreation from implementing the Proposed Action would not be significant.

4.2 BIOLOGICAL RESOURCES

Direct impacts to biological resources are those caused by implementation of the Proposed Action and are immediate and site-specific. Direct impacts on wildlife species and their habitats would result from constructing, operating, and maintaining the proposed project. Direct impacts would include loss or disturbance of species or habitat from blading, crushing, or other project activities.

Indirect impacts are those caused by the activity but would occur later in time or farther removed in distance, but are still reasonably foreseeable. Impacts from increased public access, including vandalism, are indirect impacts.

Impacts can be further categorized as short-term or long-term. Short-term impacts on wildlife would not persist beyond one or two reproductive cycles. Long-term impacts would persist for the life of the project or beyond. This is often considered to be more than ten years. Maintenance of an access road would be a direct short-term impact. The presence of the access road would be an indirect long-term impact.

Vegetation

Impacts to vegetation would be considered significant if one or more of the following occur:

- Threatened or endangered species are adversely affected.
- The population of a regional or local species is reduced to the point where it could be listed as a species of concern.
- Ecological processes are damaged to the extent that the ecosystem is no longer sustainable or biodiversity is impaired.

The Proposed Action would temporarily disturb about 53 acres of creosote bush-whitebursage community. In areas where vegetation is crushed, impacts would likely be short-term (less than ten years) and vegetation would be allowed to re-establish naturally following construction. Short-term impacts result from activities associated with structure installation, wire-pulling, and wire-splicing. Long-term impacts result from activities associated with access road restoration or construction. Since no endangered or threatened vegetation, or plant species of concern would be affected and ecosystem sustainability would not be altered, no significant impacts to vegetation would be anticipated.

Wildlife

Impacts to wildlife would be considered significant if one or more of the following criteria occur:

- Threatened or endangered species are adversely affected.
- Ongoing operations cause the habitat necessary for all or part of the life cycle of a species (e.g., lambing areas, migratory corridors) to disappear.
- The population of a regional or local species is reduced to the point where it could be listed as a species of concern.

- Ecological processes are damaged to the extent that the ecosystem is no longer sustainable or biodiversity is impaired.

During project construction, it is likely that wildlife would be impacted by habitat alteration and temporary displacement to avoid construction activities. There are desert washes crossed by the Proposed Action that may be used as wildlife corridors. Some displacement and avoidance of the washes by wildlife is likely during construction and possibly as a result of the presence of the line, although impacts would be minor because construction is short-term and the project would replace an existing transmission line.

Impacts on migratory birds would be minimized as long as nests are not disturbed during the breeding season. Potential for collisions may increase where lines are double-circuited. In spans of the lines where collisions are found to occur, Western would mark those spans to minimize collisions. Electrocutions are unlikely due to the design of electrical transmission lines at these voltage levels.

No bat roosts are known to occur within or adjacent to the anticipated construction zones; therefore, no impacts to bats or their habitat are anticipated.

As a result of resource protection measures included with the Proposed Action, none of the thresholds defined for significant impacts to common wildlife species would occur with the implementation of the Proposed Action.

Special Status Species

Impacts to special status species may be considered significant if one or more of the following occur:

- Threatened or endangered species are adversely affected.
- A special status species is adversely affected sufficient to cause its status to increase.
- Ecological processes are damaged to the extent that the ecosystem is no longer sustainable or biodiversity is impaired.

Direct impacts on wildlife species and their habitats can result from vehicle or equipment-related mortality and from ground disturbance caused by construction-related activities and project operation and maintenance. The loss of vegetative cover would adversely affect sensitive wildlife species habitat.

Indirect impacts would result from increased public access. Several special status wildlife species would be adversely affected through project implementation and are described in more detail below.

Desert Tortoise

Activities associated with project construction could injure or kill tortoises. Vehicles would pose the greatest hazard to tortoises and their burrows during project construction, operation, and maintenance. Direct impacts on desert tortoise habitat would result from ground disturbance. The resulting short- and long-term loss of vegetation would reduce the amount of forage available to tortoises. Of the 431 acres of tortoise habitat surveyed within the project area, the project would disturb approximately 32 acres of habitat. This estimate is derived from temporary and permanent ground disturbance estimates from all project related activities, including the removal and/or replacement of approximately 50 tower structures; about five miles of upgraded or new access roads; wire pulling and splicing sites; and staging areas.

Indirect impacts on tortoises would result from increases in human activity following project construction. Because this project will not provide new access to the project area, no indirect impacts would occur.

Resource protection measures and mitigation measures proposed for the desert tortoise would be effective in minimizing impacts to desert tortoises (Appendix B). The worker education program and speed enforcement would be effective in reducing vehicular hazards to tortoises. The litter-control program would prevent any increase in use of the area by ravens and would thereby prevent any increase of raven predation on tortoises. The presence of a qualified tortoise biologist for construction activities occurring while tortoises are active would ensure that any tortoises encountered are not harmed. Western would abide by the terms and conditions identified in the USFWS's biological opinion issued for the Proposed Action (Appendix C). As a result, implementation of the Proposed Action would not result in significant impacts to the desert tortoise.

Bald Eagle

Collisions with existing transmission lines are a potential impact to the bald eagle, but is unlikely given their infrequent use of the project area. Since the proposed project is the replacement of an existing transmission line, an increase in collisions would not be expected. Further, the design of Western's transmission lines meets or exceeds the criteria of the Raptor Research Foundation for minimizing electrocutions. In sum, the proposed project would have minimal impacts to the bald eagle.

Other Special Status Species

Impacts to chuckwalla and Gila monsters would be similar to those described for desert tortoises. Resource protection measures would minimize impacts to these species, resulting in non-significant impacts. Western would implement the measures set forth in the "Gila Monster Protocol for Minimizing

Impacts on the Construction Site” established by the Nevada Division of Wildlife (NDOW) on April 11, 2003 (Appendix D). For peregrine falcons, Western would coordinate with FHWA on a monitoring program and restrict construction during breeding season if an active peregrine falcon nest were located within one-quarter mile of the project area. As a result, no significant impacts to the peregrine falcon would be expected.

Desert bighorn sheep typically react adversely to human activity. However, project construction activities would be in a portion of the Eldorado Mountains where desert bighorn are habituated to humans and are accustomed to human activities as noted by FHWA (2001). Ongoing human activities associated with the project would include traffic, blasting, and maintenance activities around Hoover Dam (FHWA 2001). Any effects to this species during construction would be immediate (e.g. individuals moving to another area during the construction period), but would be unlikely to have a residual, adverse effect. Concerns were raised relative to impacts on ewes during lambing from new highway construction in the project area (FHWA 2001). However, because of the type and duration of construction activities associated with this project, ewes would be unlikely to abandon the area (Smith et al. 1986) and lambing success would not likely be affected. Further, the project is not located in a known lambing area (FHWA 2001).

A major bighorn movement corridor crosses the project area allowing the sheep to access water in the Black Canyon (FHWA 2001). Summer construction could add stress to sheep at a time of high temperatures when water availability is important. Since construction is planned for fall 2003 and winter 2004, the summer months, when bighorns are stressed the most; the majority of lambing season would be avoided. Thus, no significant impacts to the desert bighorn sheep would be anticipated.

Impacts to the rosy two-tone beard tongue, Las Vegas bear paw poppy, western burrowing owl, and bat species are expected to be negligible. Important habitat features for these species are not present in the project area. As a result, no significant impacts would be anticipated for these species.

Resource Mitigation

Mitigation measures specific to the desert tortoise for this project area are included in Appendix B. Pursuant to NDOW recommendations presented on April 11, 2003, Western would implement Gila monster protocol measures to minimize impacts during construction of the proposed project (Appendix D).

4.3 CULTURAL RESOURCES

The cultural environment includes those aspects of the physical environment that relate to human culture and society, along with the social institutions that form and maintain communities and link them to their surroundings. Two issues related to the cultural environment were considered as components of this EA: 1) historic preservation concerns, related primarily to prehistoric and historic archaeological sites; and 2) traditional cultural concerns, related primarily to places of importance to traditional American Indian communities.

Three cultural resource impact issues, which focus on specific categories of resources, were defined as:

- Loss or degradation of prehistoric and historic archaeological sites.
- Loss or degradation of special status cultural resources.
- Loss or degradation of traditional cultural places or properties.

Three types of impacts that could affect each of these three categories of cultural resources have been identified:

- Direct and permanent ground disturbance during construction.
- Direct and long-term visual and auditory intrusions.
- Indirect and permanent disturbance due to changes in public accessibility.

Archaeological Resources

Cultural resources are non-renewable and easily damaged. Damage can occur from ground disturbance, casual site visitation, and/or theft and vandalism. Direct impacts on cultural resources can occur as a result of development activity, including construction and maintenance. The potential for unauthorized collection of artifacts, minor displacement of artifacts by vehicles, and other adverse effects to cultural resources increases with additional work within the ROW. A project undertaking affects a cultural property if it alters any characteristic that qualifies it for NRHP inclusion. Impacts on archaeological resources are considered significant if sites fulfilling NRHP criteria would be physically damaged or altered; would be isolated from the context considered significant; or would be affected by project elements that would be out of character with the property or site and its setting.

An intensive cultural survey of the double-circuit reconfiguration project area was conducted to identify cultural resources within and adjacent to the 200-foot ROW, designated access roads, and in other survey areas near the Los Angeles Switchyard, Boulder City Tap, and Mead Substation. The survey identified

23 archaeological sites (19 previously recorded sites and four new sites), and 15 isolated occurrences. Of the 19 previously recorded sites, 12 were determined to be NRHP eligible. Of the four newly identified sites, two are recommended for NRHP eligibility. One site is currently unevaluated. The 15 NRHP-eligible or unevaluated sites are listed in Table 4-1. The isolated occurrences are not eligible for NRHP listing.

TABLE 4-1 NRHP-ELIGIBLE OR UNEVALUATED SITES WITHIN THE PROJECT AREA AND POTENTIAL EFFECTS		
Site Number	Site Type	Potential Effects
26CK3916	Hoover Dam Historic District	Adverse effect as transmission line structures would be replaced
26CK4046a	U.S. Construction Railroad	Used as temporary access during construction, no effect
26CK4765	Hoover Switchyard and Transformer Complex	Fiber optic cable would be connected through this switchyard, no adverse effect
26CK5180	*combined 18 transmission line system	Adverse effect as transmission line structures would be replaced
26CK6237 NV-27-M	LABPL #2 Transmission Line (currently named Hoover-Mead #7 Transmission Line)	Replacement of approximately 15 structures to this transmission line, adverse effect
26CK6238 NV-27-M	LABPL #1 Transmission Line	No improvements to this transmission line at this time, no effect
26CK6240 NV-27-P	Metropolitan Water District Transmission Line 1 (currently named Hoover-Mead #5 Transmission Line)	Replacement of approximately 15 structures to this transmission line, adverse effect
26CK6242 NV-27-M	LABPL #3 Transmission Line	No improvements to this transmission line at this time, no effect
26CK6249	Southern California Edison North Transmission Line	No improvements to this transmission line at this time, no effect
26CK6250	Southern California Edison South Transmission Line	No improvements to this transmission line at this time, no effect
26CK6251 NV-27-O	Hoover-Basic South Transmission Line	No improvements to this transmission line at this time, no effect
NV-27-O	Magnesium Basic #1 North Transmission Line (currently named Henderson-Hoover Transmission Line)	Replacement of one structure and abandonment or removal of two additional structures, adverse effect
26CK6725	rock circles	Can be avoided during construction, no effect
26CK6726	rock shelter complex	Can be avoided during construction, no effect
26CK23	Sullivan Prehistoric/Historic Turquoise Mining District (unevaluated)	No effect, no features associated with this site were identified
*Note: Site 26CK5180 is a compilation of 18 separate transmission lines		

Each of the 12 previously recorded NRHP-eligible sites and the two newly recorded sites (Table 4-1), was carefully evaluated for potential impacts from the Proposed Action. Most of the sites are transmission lines that would not be impacted by the Proposed Action. While new access roads may be built under some of these lines, they are not expected to directly or indirectly affect the historic properties. Since its decommissioning in 1961, the U.S. Construction Railroad bed (26CK4046a) has been used as a temporary access road for several transmission lines. No improvements would be made to the roadbed and, as a result, there would be no direct or indirect effects to the historic property. Crews would stake or flag the rock circles site (26CK6725) and rock shelter site (26CK6726) to assure avoidance by construction activities; therefore, there would be no direct or indirect impacts to these prehistoric features. In addition, a fiber optic cable extending from the Hoover Dam Control Tunnel would be attached to structures within the Los Angeles Switchyard. Because this is an additional feature and no structures would be replaced, no adverse effect to this site would occur.

As the result of anticipated actions, there would be direct adverse impacts to five NRHP-eligible sites. They include site 26CK6237, the LABPL #2 Transmission Line (currently Hoover-Mead #7); site 26CK6240, the Metropolitan Water District Transmission Line #1 (currently Hoover-Mead #5), and site NV-27-O, the Magnesium Basic #1 North Transmission Line (currently Henderson-Hoover). Each of these three sites is also included in two larger site designations, which have been determined NRHP-eligible. These are the Hoover Dam Historic District (26CK3916) and the compilation of 18 transmission lines (26CK5180). For both 26CK6237 and 26CK6240 there would be a replacement of approximately 15 original structures with new monopole structures. For site NV-27-O, one structure would be replaced and two other structures would be abandoned or removed. Replacing the original steel lattice structures with new structures of a different design would constitute an adverse effect to each of these sites.

Mitigation to historic structures slated for demolition typically comes in the form of a Historic American Building Survey/Historic American Engineering Record (HABS/HAER) recording. Under the provisions of Section 110b of the amended NHPA of 1966, Federal agencies must produce documentation to HABS/HAER standards for buildings or structures that are listed, or are eligible for listing on the NRHP, to mitigate the adverse effects of federal actions such as demolition or substantial alteration. The NPS regional offices oversee this aspect of HABS/HAER documentation, which is then submitted to the NPS national office for final review and conclusion in the HABS/HAER Collections. HABS/HAER documentation in the forms of measured and interpretive drawings, large-format photographs, and written histories, is archivally preserved in the Prints and Photographs Division of the Library of Congress, where it is readily available to the public. This process has been completed and approved (Schweigert 2002) or is in the process of being completed (Schweigert in preparation) for each of the historic properties facing

adverse effects. As a result, potential impacts to these five NRHP-eligible sites would be reduced to less than significant.

One of the two newly recorded prehistoric sites has no potential for effects. This site, 26CK6725 (two rock circles and lithics) would be avoided and a tribal and archaeological monitor would be present to ensure avoidance. When conductors are changed out over the site, it would be walked off, not dug through, the site. The other new site, 26CK6726, would be avoided by building a new access road to the northeast of the site, away from the monolith. An ethnographic study, involving interested tribes, would be completed. Tribal and archaeological monitors would be present during all construction at this site. Once the old structure is removed and the new structure installed, the landscape would be restored.

Western has consulted with the Nevada State Historic Preservation Office (SHPO) on the proposed changes to the five historic properties and the two new recorded prehistoric sites described above (Appendix E). With the mitigation efforts at the NRHP-eligible sites described above and included in Appendix A, the Mitigation Action Plan, no significant impacts to cultural resources would occur.

Places of Traditional Cultural Importance to Native Americans

Prior tribal consultations on the U.S. 93 Hoover Dam Bypass Project identified Gold Strike Canyon, Sargarloaf Mountain, and the Sullivan Turquoise Mine as places of traditional cultural importance to Native Americans. No effects to these TCPs would occur as these exist outside the project area. To date, correspondence received by Western from The Hopi Tribe indicates that the Colorado River and the Grand Canyon are considered traditional cultural properties, which the Proposed Action would not affect. A site visit by local Native American communities indicated that site 26CK6725 and site 26CK6726 are cultural properties of interest and may, through ethnographic study, be identified as TCPs. No other properties have been identified, although consultation with Tribes is ongoing.

4.4 VISUAL RESOURCES

Impacts to visual resources may be considered significant if one or more of the following criteria are met:

- The proposed project facilities would have a substantial adverse affect on a scenic vista.
- The project would substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings, or other special features within a locally designated scenic highway.

- The project would substantially degrade the existing visual character or quality of the site and its surroundings.
- The project would create a new source of substantial light or glare that would adversely affect day- or night-time views in the area.

Assessing of the visual resource impact is based on the contrast level that the project would have on the existing visual setting. The extent to which the proposed project would affect the existing visual setting depends on the amount of visual contrast created between the visual elements (form, line, color, and texture) introduced by the proposed project facilities measured against those visual elements of the existing landscape.

Implementation of the Proposed Action would result in adding long-term elements that would affect the existing landscape, including steel monopole tower structures, conductors, fiber optic cable, and access roads. These facilities are similar to the existing facilities that they would be replacing. The proposed steel monopoles would likely be more visible than the existing lattice structures, since the structure's mass is more concentrated and the new steelmonopoles are lighter in color and more reflective than the aged steel lattice structures. The steelmonopole structures and conductors shine should naturally be reduced over time through exposure to the elements. Although adding the proposed project facilities may be initially more visible than the existing infrastructure, they would remain consistent with those visual elements and themes that are currently present on the landscape and would likely be absorbed visually by the various transmission lines immediately adjacent to the proposed project and through the area. Impacts to views from U.S. 93 and Boulder City would not be significant since the proposed project would replace similar infrastructure and would be consistent in both scale and form with other transmission lines that criss-cross the area. Additionally, the proposed project would not impact any areas with special designations for visual resources as identified by the NPS or Boulder City Master Plan. In sum, impacts to visual resources from project implementation would be minimal and not significant.

4.5 AIR QUALITY

Impacts to air quality would be significant if implementing the Proposed Action would result in the project area being declared a non-attainment area for one or more criteria pollutants. Construction equipment would produce temporary, short-term exhaust emissions and construction activities would produce organic gas emissions. Dust produced by construction equipment and vehicles would increase dustfall and elevate local levels of PM₁₀. Because these emissions would be temporary and localized and the Proposed Action includes measures to abate dust emissions, potential air quality impacts would not

exceed Federal and State air quality standards. No Clean Air Act permit is required for this construction activity; however a dust control plan would be required prior to construction (Clark County 2003).

Constructing, operating, and maintaining a 230-kV transmission line would not result in the project area being declared a non-attainment area. As a result, no significant impacts to air quality would occur from project implementation.

4.6 WATER RESOURCES

Impacts to water resources may be considered significant if one or more of the following criteria are met.

- Surface water is contaminated by stormwater runoff from flash floods to levels above Federal and State water quality standards.
- Project activities substantially alter the area's existing drainage pattern.
- Surface waters defined as "waters of the U.S." (e.g., all rivers, permanent and intermittent streams, lakes, wetlands, and natural ponds) are degraded by dredged or fill material.

Under the Proposed Action, impacts to surface and ground water resources should be minimal. Sediment levels during runoff events are high under existing conditions, and project activities are not expected to increase these levels to any measurable degree. Drainage patterns in the area would not be expected to change as a result of project implementation. No floodplains would be impacted under the Proposed Action. Considering the resource protection measures associated with the project description, including ensuring all construction activities minimize disturbance to vegetation and drainage channels, and implementing resource protection measures to control erosion, no significant impacts to water resources are expected.

4.7 GEOLOGY AND SOILS

Impacts to geology and soils are considered significant if one or more of the following criteria are met:

- Geologic hazards (e.g., ground subsidence) would create a danger to human health and the environment.
- Soil resources are extensively disturbed resulting in severe erosion or contamination.

The primary concern of the geology and soils resources investigation was if accelerated soil erosion might occur. Erosion potential results from several factors, including slope, vegetation cover, climate, and the soils physical and chemical characteristics, and indicates how susceptible soils are to increased erosion if

disturbed. Increased soil erosion may occur when crews remove vegetation during construction or when heavy equipment disturbs the surface.

Overall, the majority of impacts to soils in the project area would be minimal due to the limited ground disturbance, which would cause indiscernible-to-minor increases in erosion rates. Removing existing structures would occur in previously disturbed areas. Installing new structures and improving associated access roads could impact approximately 53 acres of soil within the project area in terms of compaction and displacement. Impacts associated with compaction include reduced water infiltration, reduced soil porosity, reduced water holding capacity, reduced soil aeration, increased surface runoff, and increased soil erosion. The impacts of compaction in the project area would be long-term, confined to small areas and would be negligible because of the soil's sandy nature and permeability properties. Impacts associated with displacement include removing the nutrient surface layer and soil profile depletion. In general, implementation of the resource protection measures associated with the project description would minimize erosion. Therefore, direct, indirect, or cumulative impacts to geology and soils would not be significant.

Paleontological Resources

Impacts to paleontological resources are considered significant if the Proposed Action would directly or indirectly destroy or disturb a unique paleontological resource site. Unique paleontological resources are fossils or assemblages of fossils that are unusual, rare, or uncommon and those that add to an existing body of knowledge.

Under the Proposed Action, impacts to paleontological resources would be unlikely. Sediments within the Eldorado Valley are derived from Precambrian metamorphic rocks, not young sedimentary rocks where paleontological resources are typically found. Because paleontological resources would not be expected to exist within the existing project ROW and measures are included with the Proposed Action to address any paleontological discoveries, no significant impacts to paleontological resources would be anticipated as a result of project implementation.

4.8 NOISE

A project would normally have a significant effect on the environment if it:

- Substantially increases the ambient noise levels for adjoining areas.
- Exposes people to severe noise levels.

- Generates noise that would conflict with local noise standards or ordinances.

If the project were implemented, some level of noise would result from transmission line construction, operation, and maintenance. During construction, noise would be generated by the equipment used for the removal of the existing structures, clearing and grading (access roads and structure sites), assembly and erection of structures, wire pulling and splicing, and rehabilitation activities. This equipment includes heavy equipment such as cranes, trucks and tractor graders. Table 4-2 shows typical construction equipment noise levels.

TABLE 4-2 TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS	
Equipment Type	Noise Level at 50 Feet
Backhoe	85 dB
Front-end Loader	85 dB
Concrete Truck/Mixer	85 dB
Water Truck	81 dB
Tractor Grader	80 dB
Flat-bed Trucks	84 dB
Source: EPA 1971	

During the transmission line operation, noise generated would best be described as a crackling or hissing sound. The noise is most noticeable during wet-weather conditions such as rain, snow, or fog, and during the summer when there are heavy electrical loads. During maintenance activities, noise could be generated from a vehicle driving along the access roads for structure and line inspection, a helicopter flying along the ROW for structure and line inspection, or equipment and crew conducting maintenance or repairs.

In determining noise impact, the important factor is how close the activity is to people and wildlife detecting the sound. The project area is almost entirely rural open space and remote, with background noise typical of such settings. In most cases, the closest humans would be construction workers. Noise from construction (and subsequent maintenance) activities near Boulder City might be audible; however, such noise would be temporary and possibly considered only as a nuisance. In addition, noise generated from the nearby landfill and rifle range would probably have a greater effect on Boulder City residents than the installation, operation, and maintenance of a 230-kV transmission line. Noise generated from operating and maintaining the proposed project would be similar to that currently generated on the existing transmission line. Noise impacts from construction activities would be minor and short-term and

be limited by the resource protection measures proposed for the project. As a result, the Proposed Action is not expected to conflict with the local noise standards or ordinances. Thus, the Proposed Action would not cause direct, indirect, or cumulative significant noise impacts.

4.9 SOCIOECONOMIC RESOURCES

Factors considered in determining whether the Proposed Action would have significant adverse socioeconomic impacts include the extent or degree to which its implementation would:

- Induce growth or concentrations of population that exceed official local or regional population projections or that conflict with population projections.
- Induce substantial growth in an area, either directly or indirectly.
- Displace existing housing, especially affordable housing.
- Disrupt or divide the physical arrangement of an established community.
- Cause a decrease in local or regional employment.

Socioeconomic impacts can be adverse or beneficial, and short- or long-term. Property owners along the transmission line route, residents of nearby communities, and taxpayers in jurisdictions crossed by the route may experience effects. The primary socioeconomic issues associated with transmission line projects are: 1) construction-period impacts within area communities, 2) social and economic impacts along the selected route, 3) fiscal effects within local jurisdictions, 4) growth-inducing impacts resulting from the proposed project, and 5) impacts to low-income and minority populations.

Implementation of the Proposed Action could beneficially affect the socioeconomic conditions within or adjacent to the project route. Some beneficial socioeconomic impacts would result from construction spending, and to a lesser extent, maintenance worker spending. Workers based in the project area would likely be from Boulder City or in the greater Las Vegas region. Most of the workforce would be temporarily housed in these communities and a portion of their income and expenses would be “re-spent” locally, thus generating secondary income to the affected communities.

Socioeconomic impacts depend on the construction workforce size, construction schedule, and whether workers (and family members) choose to migrate to the project area. During construction, about 25 workers would be expected to conduct various tasks over a period of about three months. Since the construction work would be contracted out, it is not possible to determine the geographic origin of the workforce. If new workers are expected in the area, impacts can depend on the adequacy of existing facilities, such as housing or public services. The criterion of adverse impact, therefore, is measured in

terms of worker influx and increased demand on community services. Because the construction workforce would be small, with no permanent migration to the area, negative effects are not expected for such public services as law enforcement or fire protection.

Implementation of the Proposed Action is not expected to result in growth-inducing impacts. The Proposed Action would not include housing construction or the development of facilities that would result in population growth to the area. The demand for short-term temporary housing to accommodate employees working on the project would contribute to the respective local economies, but would not result in long-term growth inducement. The project would not remove existing obstacles to growth, nor would it inhibit growth. In sum, no significant impacts to socioeconomic resources are expected as a result of the Proposed Action.

Environmental Justice

Environmental justice has been addressed in accordance with Executive Order 12898. Effects on minorities and Native Americans were considered in this project. Disproportionate impacts on minorities and low-income populations are not expected as a result of the proposed project. Since minorities and Native Americans do not comprise a large proportion of the project area's total population, disproportionate cumulative impacts on these groups from the Proposed Action are unlikely.

4.10 HEALTH AND SAFETY

Impacts related to health and safety concerns would be considered significant if:

- Project implementation would emit hazardous emissions near an existing or proposed sensitive land use including schools or hospitals.
- Project implementation would result in serious injuries to workers, visitors to the area, or area land users.
- Project construction, operation, and maintenance activities would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Project implementation would result in exhibited health effects from substantial increases in the EMFs in the project area.

Evaluation of safety and health issues was limited to the proposed project ROW, and specifically focused on 1) public safety and construction and operation personnel working areas in the immediate vicinity of proposed overhead transmission line, and 2) electric and magnetic field effects.

Public and Worker Safety

Due to the rural nature of the project alignment, potential impacts to public health and safety is minimal. During construction, standard health and safety practices would be conducted in accordance with the Occupational Health and Safety Administration's policies and procedures, which would reduce worker safety concerns to less than significant levels. No existing or planned sensitive land uses were identified in the project area. Project activities are not expected to result in unusual safety concerns for workers in the project area. Project implementation would not affect any local or regional emergency response plan or evacuation plan. Therefore, no significant impacts to public or worker safety would be anticipated.

Electric Magnetic Fields

The possibility of adverse health effects from EMF exposure has increased public concern in recent years about living near high-voltage transmission lines. The available evidence has not established that such fields pose a significant health hazard to exposed humans. However, the same evidence does not prove there is no hazard. Therefore, in light of the present uncertainty, Western's policy is to design and construct transmission lines that reduce the fields to the maximum extent feasible.

While considerable uncertainty exists about the EMF/health effects issue, the following facts have been established from evaluating the results and trends of EMF-related research:

- Any exposure-related health risks to the exposed individual would be small
- The most biologically significant types of exposures have not been established
- Most health concerns have been related to magnetic fields.
- The measures employed for field reduction can affect line safety, reliability, efficiency, and maintainability depending upon the type and extent of such measures.

No Federal regulations have established environmental limits on the field strengths from power lines. Some states have set limits on fields from newly constructed lines, not based on factual health data. Most of Western's lines would meet those standards.

Voltage and current are required to transmit electrical power over the transmission line. EMF results from electrically charged particles which may cause effects some distance away from the line. Voltage measured in volts (or kilovolts, kV) is the source of the electric field. Current, measured in amperes, is the source of a magnetic field. Fields drop rapidly as the distance increases from the source. The electrical effects of the 230-kV transmission line are characterized as "corona effects" and "field effects."

Corona

Effects of corona are audible noise, visible light, radio and television interference, and photochemical oxidants. Field effects are induced current and voltage in conducting objects near the line, spark discharge shocks, steady-state current shocks, field perception at ground level, and the magnetic field. Corona-generated audible noise is generally characterized as a crackling or hissing noise, most noticeable during wet-weather conditions. There are no design-specific regulations to limit audible noise from transmission lines. Audible noise generated from the proposed 230-kV double-circuit line would be indistinguishable from existing conditions. Corona is visible as a bluish glow under conditions of darkness, and probably only with the aid of telescopic devices. Light would be difficult to detect at the operating voltage of 230-kV. Corona-generated interference is most likely to affect amplitude modulation (AM) broadcast band reception at transmission line voltages of 345-kV or more; frequency modulation (FM) broadcast band reception is rarely affected. This line would be constructed according to standards that minimize sources of corona, such as surface irregularities and sharp edges on suspension hardware. Corona would ionize the surrounding air and generate ozone and nitrogen oxides. The low levels of oxidants produced during operation of the proposed project facilities would not be measurable either near the line or at ground level and would not result in significant impacts.

Induced Current and Voltage

Voltage induction and the creation of currents in long conducting objects, such as fences and pipelines, would be possible near the proposed transmission line. Grounding practices and the availability of mitigation measures minimize the line's magnetic induction effects. Non-electric fences, such as those made of barbed wire directly attached to steel posts, would be adequately grounded and would not collect an electric charge. It is recommended that other types of wire fences be constructed using a least one steel post every 150 to 200 feet to ground the fence. If the induced voltage is sufficiently high on an ungrounded object, a spark discharge shock would occur as contact is made with the ground. At the operating voltage of 230-kV, and with standard design practices, shock discharge and nuisance shocks would be unlikely. Steady-state currents are those that flow after a person has contacted an ungrounded object, providing a path for the induced current to flow to ground. Design requirements that reduce or eliminate induced current and voltages would help eliminate steady-state current shocks. When the electric field under a transmission line is sufficiently high, persons standing under or near the line may perceive the raising of hair on an upraised hand. At the operating voltage of 230-kV, any perception of electric fields from the proposed line should not be detected and would not result in significant impacts.

Magnetic Field

A 60-hertz magnetic field would be created in the space surrounding the proposed transmission line conductor by the flow of current. Magnetic field is expressed in terms of teslas or gauss. The maximum magnetic fields at ground level near the transmission line would be similar to the fields developed from common household appliances (refer to Table 3-9). The levels of magnetic fields vary with the amount of current and distance from the source. There are no established limits for magnetic fields.

Magnetic fields at the edge of proposed transmission line ROW (50 feet from centerline) at maximum line capacity are calculated at 6.5 mG. At a distance of 200 feet from the centerline, the maximum fields would be less than 2 mG. Exposures to fields from the proposed line are not likely to adversely affect biological systems, because of the low levels of magnetic fields from the proposed line and because the proposed line would not be located near occupied residences. No significant adverse impact is anticipated.

4.11 HAZARDOUS MATERIALS AND SOLID WASTE

Hazardous materials and solid waste impacts would be considered significant if:

- The proposed project creates a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or solid waste.
- The proposed construction activities include handling of hazardous materials, substances, or waste within one-quarter mile of sensitive land uses, including schools and residences.

Crews would remove solid waste generated by the proposed project, including the replaced lattice structures, from the project area and transport it to an appropriate facility for disposal. Structure replacement activities would not generate any hazardous emissions. No hazardous emissions or acutely hazardous materials, substances, or waste would be handled near sensitive land uses, such as residences. The proposed project would not require long-term storage, treatment, disposal, or transport of hazardous materials. Western's standard construction specifications require the contractor to complete and have a Spill Response Plan on file with Western. Crews would handle regulated materials under Federal, State and local laws and would leave no regulated material on site. For these reasons, and the implementation of the resource protection measures associated with the project description, no significant hazardous materials and solid waste impacts would be expected.

4.12 CUMULATIVE IMPACTS

Cumulative impacts are those additive or interactive effects that would occur due to the Proposed Action's incremental impact when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such actions.

While there are cumulative impacts to all affected resources, Council on Environmental Quality (CEQ) guidelines limit cumulative impacts analysis to "important issues of national, regional, or local significance" (CEQ 1997). Therefore, not all issues identified for direct and indirect impact assessment are analyzed for cumulative impacts. In this case, the Proposed Action is replacing steel lattice structures with steel monopole structures for existing 230-kV transmission lines, and the other past, present, and future actions are other pole replacement projects, interconnection projects, and other development projects within the project vicinity. Methods to identify other past, present, and future actions that could, in combination with the Proposed Action, contribute to cumulative impacts include coordinating with land management agencies and using the recent cumulative impact assessment conducted as part of the Boulder City U.S. 93 Corridor Study.

Past Projects

Transmission Lines and Mead Substation in Eldorado Valley

Construction of the various transmission lines, switchyards, and the substation occurred over a period of roughly 60 years, resulting in intermittent short-term impacts to air quality, biological, and visual resources. Possible long-term impacts to vegetation and wildlife can be attributed to numerous maintenance access roads used to service the transmission lines and structures. The prominence of the transmission lines has been a long-term visual impact on the desert landscape, contributing to cumulative impacts. No cumulative impacts are expected to result from these past projects in conjunction with the Hoover Dam Bypass Project Phase II.

Boulder City Rifle Range

The Boulder City Rifle Range opened in spring 1933. In 1941, the range was taken over by the Army to train those responsible for safeguarding Hoover Dam from attack. The range was subsequently returned to the club at the end of World War II. In 1961, the club sought to purchase the property, but leased the property instead. The Boulder City Rifle Range is less than one mile east from the transmission corridor. Those using the range may experience noise during transmission line construction. Also, the range is located at the base of the Eldorado Mountains in desert tortoise habitat. Cumulatively, the loss of habitat

and noise activities from planned activities is not expected to adversely affect biological resources within the project area.

U.S. Hoover Dam Bypass Project (Phase I)

Because of the U.S. 93 Hoover Dam Bypass Project and the planned removal of Western's A&N Switchyard, Western has removed or modified existing electrical transmission components and erected new electrical transmission components, including monopole structures. This project, commonly referred to as Western's U.S. 93 Hoover Dam Bypass Project Phase I, extends from the Hoover Dam area to a point about two miles southeast of the Dam, where it connects to the Proposed Action. This project is similar to the Proposed Action since existing steel lattice structures were removed and replaced with monopole structures and the existing single-circuit was replaced with a double-circuit.

Cumulative impacts to wildlife, visual resources, and archaeological resources may result when considering the activities associated with Phase I and Phase II. Impacts to the desert tortoise, desert bighorn sheep, and cultural sites (specifically existing transmission lines) would be reduced through mitigation. Cumulative visual impacts would not be significant since Phase I and Phase II project activities occur within an existing transmission line corridor.

Reasonably Foreseeable Future Actions

U.S. 93 Hoover Dam Bypass Project and Boulder City U.S. 93 Corridor Project

Environmental studies associated with the U.S. 93 Hoover Dam Bypass Project have been completed. FHWA issued a Record of Decision in March 2001. Some activities associated with the project, such as replacing Western's transmission line structures adjacent to the road alignment, have been completed. Road and bridge construction activities for this project are expected to begin in the near future. The Boulder City U.S. 93 Corridor Study is in its final stages. The Corridor Study has identified a preferred bypass alignment around Boulder City that closely parallels Western's Proposed Action. Depending on the timing of project development, construction activities associated with the U.S. 93 Hoover Dam Bypass Project and the Boulder City U.S. 93 Corridor Study could overlap resulting in cumulative short-term biological, cultural, air quality, traffic, noise, visual, or water quality impacts.

Cumulative impacts to vegetation and wildlife may result when considering the affects of the Proposed Action with the reasonably foreseeable future highway development projects. Transmission line facility construction would result in cumulative impacts to portions of the environmental resource base also impacted by the U.S. 93 Hoover Dam Bypass Project and Boulder City U.S. 93 Corridor Study build

alternatives. These impacts include biological resources, including desert bighorn sheep and desert tortoise habitat; archaeological and historic properties; Section 4(f) lands; water quality; and visual resources in the U.S. 93 corridor. Long-term impacts on desert bighorn sheep and desert tortoise can be expected; however, impacts to these species would be reduced through mitigation. The cumulative construction impacts would be minor and essentially equivalent to the individual project occurrences.

Summary of Cumulative Impacts

Within the Eldorado Valley, several projects could cumulatively impact the region's resources. However, with adequate mitigation, particularly for biological and cultural resources, these or other impacts are substantially reduced. The proposed project, when considered in a cumulative sense with other past, present, and future actions, would not be expected to significantly increase impacts to these resources.